

Bluetooth  
BQB  
Qualified

# BOOST™ Core

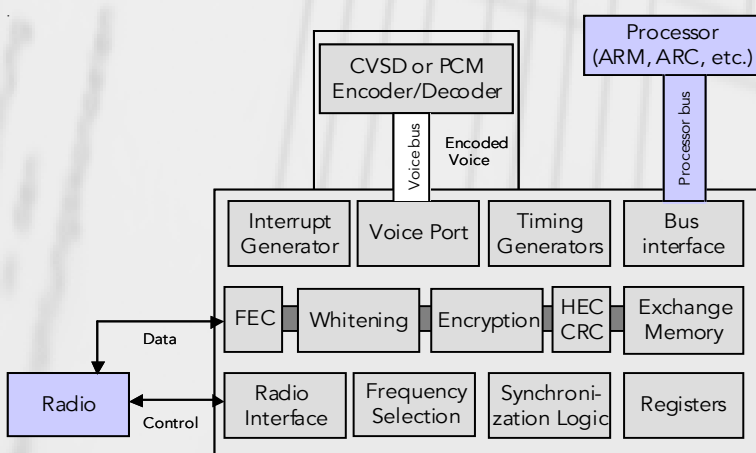
Bluetooth® baseband processor core for integration into Bluetooth standard ICs and ASICs. Complemented with BOOST™ Software to implement a Bluetooth protocol stack.

## Product Features

- Compliant with Bluetooth specification v1.1 and v1.2
- Designed in synthesizable VHDL for easy technology migration
- Low power consumption
- Low gate-count
- Low operating frequency dynamically selectable between 12, 13 and 16MHz
- Optional support of Adaptive Frequency hopping (AFH) in piconet and scatternet operation for improved coexistence with devices operating in the ISM band
- Supports various radio chips via a selectable Interface
- Supports 0dBm and 20dBm radio modules
- Direct voice bus from CVSD transcoder (optional for voice applications, 20k gates), up to 3 voice channels
- Optimized interface to BOOST Software
- Designed for easy integration into an ASIC
- Reusable block to be plugged on fast processor bus (AHB/ASB)
- Flexible processor interface (ARM, ARC, etc.)
- DFT ready, accepted by major ATPG tools
- Supplied selection of scripts:
  - VHDL Compilation
  - Synthesis
  - Test insertion
- Supplied with test bench suite permitting re-verification of the core after user edits
- Hardware encryption
- Bluetooth clock and multiple offsets management for scatternet operation in master and slave devices
- Supports Bluetooth low power modes (sniff, hold and park)
- Supports all packet types:
  - Control packets
  - Voice packets
  - Mixed voice-data packets
  - Single-slot data packets
  - Multi-slot data packets
- Comprehensive documentation and training
- Turnkey IC design service available on request

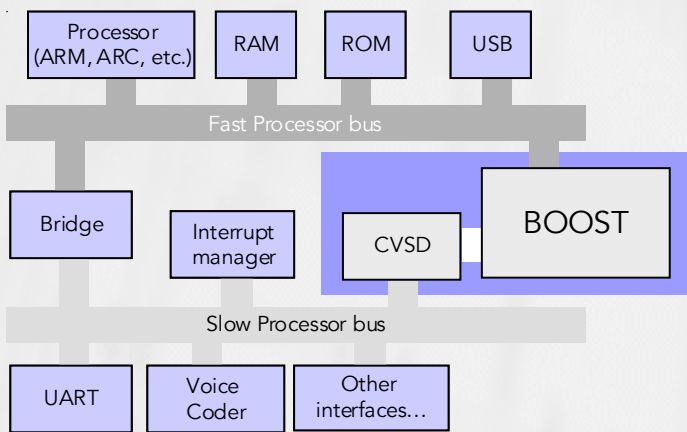
## Integration into a Bluetooth ASIC

The BOOST Core has been designed for integration into an ASIC, as shown in the typical system overleaf. A RAM and a ROM (could also be EPROM, EE-PROM, OTP or Flash memory) are necessary to host the BOOST Software. The CVSD transcoder (available as an option) and a voice coder are necessary to support voice operation. For data applications, it is possible to input a data stream from a UART, PCI, proprietary interfaces or a USB interface. However, the complete application can be integrated on-chip and generate a data stream to be transferred via Bluetooth wireless technology.



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System-on-Chip for a Connected World



## Embedded Exchange Memory

The Exchange Memory is a static RAM embedded inside the BOOST Core containing control structures and data buffers. Its size can be tailored to the application and is typically somewhere between 2 and 12KBytes.

The processor and the core both access the Exchange Memory: a synchronization and prioritization mechanism is implemented to ensure a clean handshaking between the hardware and the software, avoiding any real-time issues.

The Exchange Memory and registers are memory mapped on the core's address range (17-bit addressing range).

## Link with BOOST Software

The BOOST Software has been developed with the BOOST Core in order to optimize the hardware-software interface and fully exploit the performance of the block.

Interrupts are generated at selectable times to synchronize the software processing with the operation of the core. A single line of interrupt is sent to the processor.

## Validation

The BOOST Core and BOOST Software have been validated on the BOOST development board. This board is available for ASIC prototyping and software development.

## Interfacing to the BOOST Core

The BOOST Core interfaces to a fast processor bus. This bus ensures that data can be moved quickly between the processor and the Exchange Memory embedded into the core. The bus interface has been optimized for the ARM™ processor, but other processors (eg. ARC) are also supported.

A proprietary interface is provided to link the BOOST Core to the CVSD transcoder for voice applications, in order to be able to process a continuous voice stream without the need of processor intervention. In addition PCM format is supported.

Several radio components, from various manufacturers, can be attached to the BOOST Core. A programmable radio interface block supports several radio components from various manufacturers. The radio interface settings can be programmed by software to work with the chosen radio component. The core interface is fully digital. Some additional A-to-D or D-to-A converters may be required to interface to specific RF modules. These can also be integrated directly on the baseband chip.

The BOOST Core can be used together with the BOOST™ Radio, NewLogic's Bluetooth CMOS radio core in order to implement a single chip Bluetooth solution.

## About NewLogic

NewLogic Technologies, headquartered in Lustenau, Austria, is a leading global supplier of IEEE 802.11 Wireless LAN and Bluetooth intellectual property (IP) cores and next generation cellular

technology. In addition NewLogic offers IC design and IP integration to help its customers achieve their aggressive time to market goals. Further information is available at <http://www.newlogic.com>.

